

Ser. No. 10/605,534
Art Unit: 2816

3

Printed 1/21/2005

In the specification:

Please change paragraphs [0002], [0038], [0040], [0041], and [0043] as follows:

- 5 **[0002]** Semiconductor chips such as complementary metal-oxide-semiconductor (CMOS) integrated circuits (IC's) sometimes perform voltage-sensing. An input voltage from some source is sensed to generate an output voltage. A voltage comparator is often used to sense the input voltage. The voltage comparator compares the input voltage to a reference voltage and generates the output voltage in a high state ~~when the high state~~
10 when the input voltage is higher than the reference voltage, and generates the output voltage in a low state ~~when the high state~~ when the input voltage is less than the reference voltage.
- 15 **[0038]** At low temperature such as at negative 40 degrees C and best process conditions, both reference voltage Vref1 (line 70, about 0.91v) and input voltage Vin1 (curve 76) drift upward. The cross-over point is at $V_p = 5.2v$, which is just 4% higher than the typical value (intersection of line 72 and curve 78). At high temperature (85 degree C) and worst process conditions, both reference voltage Vref3 (line 74, about 0.48v) and input voltage Vin3 (curve 80) are drifting down, keeping the cross-over point of line 74
20 and curve 80 at $V_p = 4.9v$ which is only 2% lower than its typical value. Thus the range of cross-over points is from 4.9 to 5.2 volts (within +/- 4%) as temperature and process are varied.
- 25 **[0040]** At room temperature and with a typical process, reference voltage Vref2 is set at about 0.92 volt, as shown by horizontal line 84. When V_p is ~~swept from 0 to 7v, input voltage swept from 0 to 10v.~~ input voltage Vin2 (curve 90) decreases from 2.2 volts to about 0.5v. The cross-over point of line 84 and curve 90 is at $V_p = 8v$. Once Vin2 crosses over this point, comparator 63 switches and drives output signal Vo high.
- 30 **[0041]** At low temperature such as at negative 40 degrees C and best process conditions, both reference voltage Vref1 (line 82, about 1.46v) and input voltage Vin1 (curve 92)

Ser. No. 10/605,534
Art Unit: 2816

4

Printed 1/21/2005

drift upward. The cross-over point is at $V_p = 8.6v$, which is 7.5% higher than the typical value (intersection of line 84 and curve 90). At high temperature (85 degree C) and worst process conditions, both reference voltage V_{ref3} (line 86, about 0.6v) and input voltage V_{in3} (curve 88) are drifting down, keeping the cross-over point of line 86 and curve 88 at 5 $V_p = 7.6v$ which is only 5% lower than its typical value. Thus the range of cross-over points is from 7.6 to 8.6 volts (within +/- 8%) as temperature and process are varied.

[0043] Several other embodiments are contemplated by the inventor. For example the two branches can use the same size devices or could use different sizes to adjust the 10 cross-over voltage points. Transistors may have several legs or may have unusual geometries such as doughnut rings. Resistors may be made from N-well, polysilicon, or other resistive material. A variety of circuits may be used to generate the stable voltage V_{bg} , such as a band-gap reference circuit. The resistors could be implemented as transistors with gates connected to a fixed bias voltage or connected as a diode (gate and 15 drain tied together). The substrate or bulk node could be an N-well or a P-well with a n-type substrate or region such as an oxide-isolated n-type tub. The comparator may be powered by the VDD supply voltage. The voltage generator, such as a band-gap voltage generator, or voltage generator 66 of Fig. 5, may generate a stable voltage on the stable node that is independent of the supply voltage to the comparator.

20